

<sup>Book 11</sup>  
CARNOCHAN (J.M.)

*Dr Carnochan*  
*through*  
CONTRIBUTIONS

TO

OPERATIVE SURGERY,

AND

SURGICAL PATHOLOGY,

BY

✓  
J. M. CARNOCHAN,

PROFESSOR OF SURGERY IN THE NEW YORK MEDICAL COLLEGE, SURGEON-IN-CHIEF TO THE STATE EMIGRANTS' HOSPITAL, ETC.

WITH ILLUSTRATIONS DRAWN FROM NATURE.

*Case,*

PHILADELPHIA

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1858.



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THE FEMORAL ARTERY, WITH CASES.

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D E D I C A T I O N .

TO

GULIAN C. VERPLANCK, LL. D.,

STATESMAN AND SCHOLAR,

WHOSE INTELLECT, DURING A LONG AND ILLUSTRIOUS CAREER, HAS BEEN DEVOTED TO THE

SERVICE OF HIS FELLOW MAN,

THIS WORK IS

RESPECTFULLY DEDICATED;

IN TESTIMONY OF THE ADVANTAGES THE STATE EMIGRANTS' HOSPITAL HAS DERIVED FROM HIS UNWEARIED

VIGILANCE AND ADMINISTRATIVE ABILITY,

AS PRESIDENT OF THE HONORABLE BOARD OF COMMISSIONERS OF EMIGRATION;

BY

THE AUTHOR.





E P I S T L E .

TO VALENTINE MOTT, M. D., LL. D.:

MY DEAR SIR:

A witness, from early youth, of your efforts for the advancement of our Art, I naturally attach a high value to your opinion upon surgical subjects. Permit me, therefore, to ask your perusal of these contributions, and, at the same time, to express my acknowledgment that whatever merit they may display is to be attributed, in a measure, to your example.

Richly endowed by nature, your genius acquired its fine proportions under the tuition of Cooper, the disciple of Hunter; whose methods and principles you were thus enabled to inaugurate successfully in the schools of your native land. With this signal service to science, as well as with several great and original improvements in Operative Surgery, your name will ever remain associated; and, for my part, I regard it with the veneration which becomes a pupil who is sensible of the beneficial influence you have exercised over his surgical career.

Animated by this sentiment, I beg leave to subscribe myself,

Your most obedient servant,

J. M. CARNOCHAN.





## P R E F A C E.

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FOLLOWING the example of my early and illustrious Master, Professor Syme, of Edinburgh, I publish these contributions in a collected form, in the hope that they will be found useful by those who recognise, that it is from the study of particular facts, Operative Surgery frequently derives its most valuable suggestions. The life of man is too short to allow him, even with the greatest industry, to witness all the varieties of accident or disease; and, as there is no limit to the multiplicity of pathological differences, the most experienced practitioner may find himself in the presence of unknown and unforeseen conditions. Hence, it is incumbent on the surgeon to read much, as well as to see much, and to extend his knowledge as far as possible beyond the sphere of his own immediate observation. This is especially the duty of country practitioners, and of practitioners in small towns and villages, and even in the case of Surgeons dwelling in the midst of large centres of population, with corresponding hospital facilities, it will not do to neglect the experience of other men, under the penalty of abdicating progress in both the Science and Art of Surgery. The practitioner may be deficient, without blame, in some of the natural endowments which go to make the complete surgeon: he may be wanting in tact, in presence of mind, in clearness of vision, in manual dexterity, or bodily strength: but, a conscientious man will never be able to justify to himself an incapacity which proceeds from ignorance of the recorded triumphs of Operative Surgery, in difficult cases. These are not always described at length in the text books, and, in fact, can only be known through the current surgical literature of the day. The

Science of Operative Surgery exhibits results in a harmonious and systematic shape: but, these results are precisely the particular facts by whose assistance science is advanced—the elements, without which science could not exist at all. The methodical treatise, or *Corpus Scientiæ*, is indispensable to the Professor, the Practitioner, and the Student: but, after all, it must be recollected, that the progress of Operative Surgery is chiefly effected by the discoveries of great surgeons in particular cases, and by new methods which effect cures that were once deemed beyond the reach of art. Thus, the treatment of aneurism by the method of Hunter, was a progress in Operative Surgery; for, it enabled the surgeon to effect the cure of aneurism in cases which had always before been regarded as hopeless.

In some of the cases contained in these contributions, the methods are essentially curative—as in the exsection of the entire Ulna, and in the exsection of the entire Radius, where the amputation of the entire member is avoided: in others, the methods are purely operative; but, whether curative or operative, I flatter myself that they are entitled to consideration, in many instances, on the ground of originality of conception. And, I may add here, that while respect for life will dictate to the surgeon the greatest prudence—will counsel him to attempt no operation which he would not be willing to perform on his own child, it will also teach him, that if the extremes of boldness are to be shunned, pusillanimity is not the necessary alternative. The surgeon who has not sufficient courage to propose a useful operation, and sufficient skill to perform it, is as open to censure as the reckless practitioner who is swayed by the unworthy lure of notoriety.

*New York, 45 Lafayette Place.*

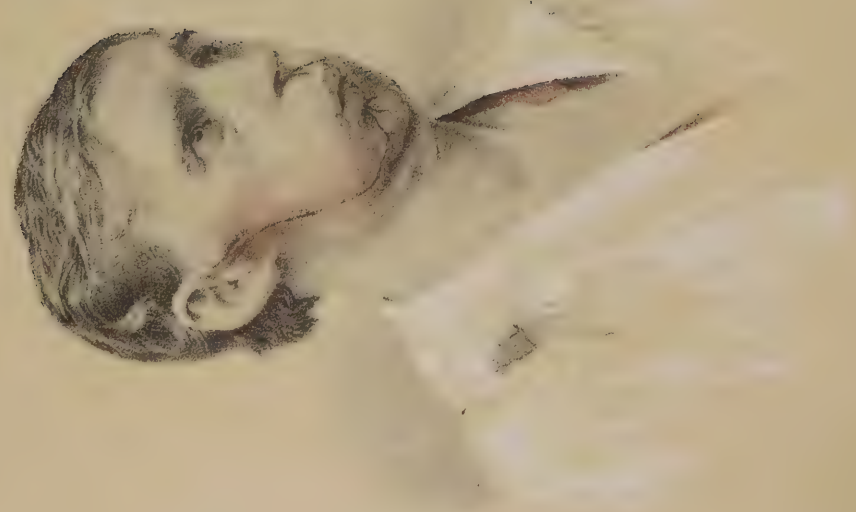
*January, 1858.*





APPEARANCE OF THE PATIENT FOUR MONTHS AFTER THE OPERATION.

Fig. 2

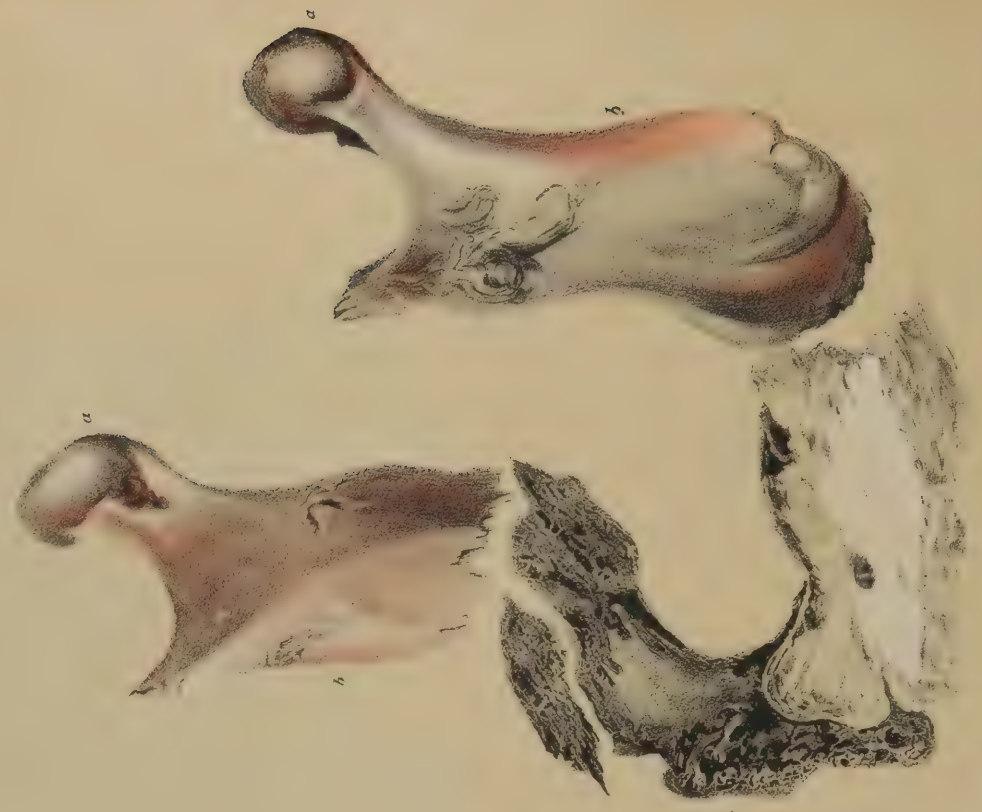


Upon the side of the face, the cicatrix is seen, showing the line of the external incision; a similar incision made upon the opposite side, meets the other at the Chin

CASE OF AMPUTATION OF THE ENTIRE LOWER JAW.

Fig. 1

THE LOWER JAW - AFTER MACERATION.



Engraved by J. H. Smith, & Coloured by J. H. Smith, N.Y.

a Condyles of the jaw  
b Body of the jaw in a state of necrosis, and seen as separated during the operation.









# AMPUTATION

## OF THE

### ENTIRE LOWER JAW.

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[ From the New York Journal of Medicine, January, 1852. ]

NOTWITHSTANDING the repeated instances on record of large portions of the lower jaw having been lost by accident or disease, surgeons appear to have been slow in admitting the possibility of practising amputation, either partial or total, of this bone. To Dupuytren was reserved the glory of having, in 1812, first removed, by a methodical operation, a portion of the body of the inferior maxilla; but since the innovation of the celebrated French surgeon, the operation for the partial exsection of this bone has been repeatedly performed. In the annals of surgery, there is an *allusion* made to the amputation of the *entire* lower jaw, by Walther, of Bonn; but I have not been able to trace the truth of it to an official source.

The following case will prove that this operation can be performed with success; and that the patient, although deprived of the chief instrument of mastication, may survive, and enjoy the usual condition of health.

Nicholas Donegan, aged 43, a farmer by occupation, was admitted into the New York Emigrants' Hospital, March 7th, 1851. He was treated for some weeks, in the Medical Division, for typhus fever, and was afterwards transferred to the Surgical Department, under my charge. Upon examination of the patient, his face presented much tumefaction, and he complained of great pain, seated chiefly in the region occupied by the inferior maxilla. Upon carrying the examination further, the lower jaw was found to be extensively affected with necrosis. All the external appearances denoting

a cachectic condition of the constitution, with extreme debility and general prostration of the vital functions, were present. The patient stated that, during his recent voyage to this country, he had received a severe blow upon the lower jaw and side of the face. This circumstance, coupled with the cachectic condition following the attack of fever, appears, as far as can be learned, to have been the origin of the disease of the bone.

A tonic course of treatment was prescribed for him, and various local applications and lotions were resorted to, in order to allay the irritation in the mouth, and abate the fetor emanating from the disease. In a short time, the teeth became loose, and had to be extracted; the alveolar ridge became partially denuded; the swelling increased towards and over the rami and condyles; and the patient complained of excruciating suffering and depression. Nutritious diet and the various therapeutic agents proper to improve and renovate his system, were persevered in; and soothing and astringent lotions and applications were unremittingly used. This plan of treatment was pursued for about three months; at the expiration of which time, it became evident that the disease of the osseous tissue was too deeply rooted to be affected by mere remedial agents. In fact, they were found to be entirely unavailing. The disease had now apparently seized upon the entire jaw; pus was abundantly secreted into the cavity of the mouth; the saliva was also thrown out in great quantity; and the fetor became almost intolerable to the patient himself, and to those around him in the ward. Constitutional irritation and hectic of a grave character had also set in; diarrhæa made its appearance; and the patient was gradually sinking under the complications of his disease, and the terrific pain by which he was unceasingly tortured. It was apparent to me that the speedy death of the patient could only be avoided by removing the source of such intense suffering and constitutional derangement. The integuments over the diseased bone, although much tumified, œdematous, tense and red, remained free from ulceration; the vitiated secretions taking their exit by the cavity of the mouth.

On the 13th of July, a consultation was held, and an operation for the removal of the bone decided upon. The formidable nature of the operation proposed, together with the debilitated and cachectic condition of the



patient, induced me to enter into full explanations, and to inform him of the great risk that would attend it. The matter was then left to himself, and, at his urgent request, I proceeded to use my efforts for his relief. It was not thought expedient to administer either chloroform or ether, on account of the liability to asphyxia from the passage of the blood into the wind-pipe.

The patient being seated on a chair, and the assistants properly arranged, an incision was first made, commencing opposite the left condyle, passing downwards towards the angle of the jaw, ranging at about two lines in front of the posterior border of the ramus, extending thence along the base of the jaw, and terminating by a slight curve on the mesial line, half an inch below the free margin of the lower lip. The bone was now partially laid bare, by dissecting upwards the tissues of the cheek, and by reflecting downwards, for a short distance, the lower edge of the incision. The tissues forming the floor of the mouth, and situated upon the inner surface of the body of the bone, were separated from their attachments, from a point near the mesial line, as far back as the angle of the jaw. The attachments of the buccinator were next divided. The facial artery, the sub-mental and the sub-lingual, already cut, were then secured by ligature. It was now seen that the bone was partially separated at the symphysis, and that the necrosis was complete from that point to the anterior portion of the ramus. The ramus itself was found diseased; the periosteum externally was inflamed, and in some parts easily detached. The tongue was now grasped and held forwards, while the attachments of the genio-hyo-glossi muscles were divided. A double ligature was passed through the anterior part of the root of the tongue, and entrusted to an assistant, in order to prevent its retraction upon the superior orifice of the larynx. A fatal case, from the falling backwards of the tongue, occurred a few years ago, in the practice of an eminent surgeon of this city; and a similar misfortune should always be guarded against, when the muscular attachments of the tongue to the posterior part of the bone behind the symphysis are divided. A slight force exercised upon the left half of the body of the jaw, broke the connection at the symphysis and at the angle, and this part was easily removed. The next step consisted in the removal of the left ramus. The external surface of the branch of the jaw, and of the tem-

poro-maxillary articulation were exposed, by dissecting the masseter upwards, as far as the zygomatic arch. Seizing the ramus in order to pull the coronoid process downwards below the zygoma, it was found that the temporal muscle was rigidly and permanently retracted. This circumstance presented an unexpected difficulty, which was increased by the unusual development of this apophysis, and by the retraction also of the pterygoid muscles. Passing the forefinger along the inner aspect of the ramus, the situation of the internal and external carotids was sought for and recognised. The insertion of the pterygoideus internus was then felt and cut, grazing the bone in doing so; the lingual nerve, here in close proximity, being carefully avoided. Passing still higher up, the orifice of the dental canal, indicated by an osseous projection, could be felt; and the instrument, still guided by the finger, divided the dental artery and nerve. The knife was thus made to separate the tissues attached to the inner face of the bone, as high up as a point situated about a line below the sigmoid notch, between the condyle and the coronoid process. On a level with this point, at the posterior margin of the ramus, the transverse facial, internal maxillary and temporal arteries form a kind of tripod, the two last-named branches of which should not be divided, if possible. It now became necessary to detach the tendon of the temporal muscle. As the coronoid process could not be depressed, I proceeded cautiously, by dividing the lower attachments of the tendon, by means of blunt curved scissors; and by using them and a probe-pointed bistoury, alternately—keeping close to the bone—a considerable portion of the tendon was divided. Deeming it not prudent to use freely a sharp-cutting instrument, deep in the temporal fossa, where the coronoid process was situated, I made use of a pair of bone scissors, curved flatwise; and, by passing the blades of this instrument over the process, as far as its position would permit, the temporal muscle was detached; a small portion of the apex of the coronoid process being cut through. The ramus, now movable, could be made use of as a lever to aid in the disarticulation of the bone.

In order to effect safely the disarticulation of the condyle, I began by penetrating into the joint; cutting the ligaments from *before backwards*, and from *without inwards*. The articulation was thus opened sufficiently to allow



the condyle to be completely luxated. Blunt-pointed scissors were now used to cut carefully the internal part of the capsule and the maxillary insertion of the external pterygoid muscle; and, by a slow movement of rotation of the ramus upon its axis, the condyle was detached, and the operation was completed on this side. By proceeding to disarticulate by the method here described, injury to the temporal artery, as well as to the internal maxillary, was avoided.

To effect the removal of the other half of the lower jaw, the same incision was made on the opposite side, so as to meet the first on the mesial line. The dissection was also similar; and by disarticulating the second condyle in the same manner as had been observed for the first, I was successful again in avoiding lesion of the temporal and internal maxillary arteries.

The annexed plate, No. 1, is a correct delineation of the inferior maxilla, after maceration, and exhibits the portions of the bone as they became separated during the operation.

The object I had in view, in shaping the external incisions in such a way that an inverted V should be formed in front of the insertion of the genio-hyo-glossi muscles, was to leave a portion of integument so fashioned, that the suture-pins could be passed through the integument, and, at the same time, through the root of the tongue, at the point where its muscles had been detached from the inner surface of the jaw. The several tissues becoming thus incorporated in the resulting cicatrix, served to form a new bridle, somewhat analogous to the natural muscular attachments of the tongue to the genial processes.

The amount of blood lost was inconsiderable; the arteries divided, besides those mentioned, were the transverse facial, the anterior masseteric, the anterior parotidean, &c.; and these were secured as soon as divided. The bone being disarticulated, the flaps were adjusted, and the lips of the incision united, by eighteen points of twisted suture. The tongue was retained forwards after the dressing, by attaching the ends of the ligature already passed through its base, on each side, to a bandage passed vertically around the head. Forty-eight hours after the operation, the first dressing was removed:

union by first intention had taken place, and eight of the suture-pins were taken out. In ninety-six hours the wound was again examined: union was found to be entirely completed, and the remaining pins were removed. On the seventh day, it was thought safe to remove the ligature from the tongue. On the tenth day, the arterial ligatures came away; and on the fourteenth day, the patient was pronounced cured; not having had an untoward symptom since the performance of the operation.

The operation occupied fifty-five minutes, the patient having been allowed intervals of repose to recruit. It was performed in the presence of a number of professional gentlemen; and I was ably assisted by my colleague, Dr. A. V. Williams, Drs. Dewees and Dixon, of New York, and by Drs. Thompson, Whitehead, Smith and Bailey, resident assistants attached to the surgical staff of the Hospital.

The present appearance of the patient, upon reference to the accompanying plate, No. 2, will be seen to present much less deformity than might be expected from the severe mutilation which he has undergone. His general condition and health are good; and he is now able to perform any ordinary vocation. The ducts of Steno, on both sides, were necessarily divided in the superficial incisions; but there is no salivary fistula, the saliva taking its course into the mouth. The division of the branches of the facial nerve has not been followed by permanent paralysis of the face; although, for a time after the reunion of the incision, the orbicularis palpebrarum of the right side appeared to have lost its action to some extent. In grasping the chin, a thin cartilaginous deposit can now be felt, extending, crescent-shaped, for about three inches, and occupying the position at which the bone was most diseased. Higher up, toward the glenoid cavity, no deposition of bone or cartilage has taken place. Injury to the bag of the pharynx, during the detachment of the soft tissues from the angle of the jaw, was carefully avoided, and fluids could be swallowed, in small quantities, immediately after the operation. Deglutition is now effected without difficulty. Articulation is sufficiently distinct to render his words intelligible, and although unable to masticate, he does not complain of difficulty in eating, breaking up, as he says he does, his food between the tongue and the palatal vault of the superior maxillæ.



Disarticulation of the lower jaw, by external incision, at the temporo-maxillary articulation, can be accomplished without wounding the duct of Steno, or the trunk of the portio dura—as the following case will illustrate:—A gentleman about 45 years of age, from the State of Vermont, consulted me for a cancerous growth springing from the body of the lower jaw, upon the right side. The tumour encroached upon the cavity of the mouth, and also formed a considerable tumour externally. The disease of the bone was supposed, before the operation, to extend from the angle of the jaw, as far as the second small incisor tooth of the right side. The operation for removal was commenced by an incision of the soft parts, beginning at a point below the duct of Steno, near the posterior margin of the ramus of the jaw. This was prolonged downwards as far as the angle of the jaw, and then carried forwards, along the lower border of the ramus, as far as a point opposite the first incisor tooth, with a slight curve; the border of the lower lip not being divided. Upon laying bare the diseased bone, I was induced to believe that the disease extended farther upwards upon the ramus than had been anticipated. The remaining portion of the ramus was exposed by dissecting, and by pushing upwards with the handle of the scalpel, the tissues resting upon it. The jaw was now divided by the chain-saw, opposite the second incisor tooth. This allowed the diseased portion to be depressed so as to place within reach the insertion of the temporal muscle. A pair of bone scissors, blunt on the point, and curved flatwise, was made to separate the temporal muscle, at its insertion into the coronoid process. The tissues over the articulation were then drawn upwards; and the joint being entered at its external and anterior part, disarticulation was easily accomplished.

NOTE.—I have in the text, as originally written, given the credit of priority to Dupuytren for the removal of a part of the lower jaw. Professor Eve, in his recent work—"Collection of Remarkable Cases in Surgery"—has brought forward very strong evidence in favor of Dr. Deaderick, of Tennessee, as the originator of this operation. The question stands thus:—Dupuytren's case was recorded in 1813, and published to the scientific world; Dr. Deaderick's case is said to have occurred in 1810, but was not published until 1823; in other words, it was a claim made after thirteen years of silence on the subject. The name of my celebrated and esteemed preceptor, Professor Mott, is also identified with the early operations for partial removal of the lower jaw. In fact, Professor Mott's first operation for the removal of a portion of the lower jaw, for osteosarcoma, was published in 1822, or one year prior to the publication of Dr. Deaderick's case.

REMARKS  
ON  
AMPUTATION OF THE LOWER JAW.

---

[From the New York Medical Journal, May, 1852.]

SINCE the publication of my case of amputation of the entire lower jaw in the January number of the Journal, I have been led to investigations which justify me in presenting it as the first successful operation of the kind reported in the annals of surgery. The operation attributed to Walther, of Bonn, cannot be admitted as authentic; not because it presented formidable surgical difficulties, although such must always exist, but because no such operation is recorded either by himself or by an eye-witness. I am not alone in this opinion. Velpeau, the great compiler of surgical literature, alludes to it in a brief note [*Nouveaux Elemens de Medecine Operatoire*. Paris. 1839. vol. ii., p. 610], as a mere rumor, unsustained by proof. Nelaton [*Elemens de Pathologie Chirurgicale*. Paris. 1849. p. 749] also alludes to the operation as a mere rumor. The most eminent German authority, Dieffenbach, in his Operative Surgery, [*Die Operative Chirurgie*. Leipzig. 1848. Zweiter Band. p. 56], under the caption of "Exarticulation of the Entire Lower Jaw," describes a *cadaveric* operative procedure, but makes no allusion to Walther in this relation. Chelius, another eminent German professor [*System of Surgery*. By J. M. CHELIUS. Translated from the German, with notes, by John F. South. Vol. iii. Philadelphia. 1847. p. 745], under the caption of "Excision of the Lower Jaw," says that "even the *total extirpation of the lower jaw* may be indicated by various kinds of disease," but does not pro-



ceed to mention Walther, or any other surgeon, as ever having performed that operation. From this silence it may be inferred that he assumes that the operation was thitherto wholly unknown in the records of surgery. The latest French authority, M. Vidal (de Cassis), [*Traite de Pathologie Externe de Medecine Operatoire*. Paris. 1851. Vol. iii., p. 509], holds this language in regard to Walther's operation: "Success (in an amputation of the entire lower jaw) is attributed to Walther, of Bonn;" and further on, "the success spoken of is unique; it has not even an irreproachable authenticity."

There is an operation transcribed from the Italian into the *Gazette Medicale* for Nov., 1854, p. 758, under the head of "Extirpation of the Entire Lower Jaw by sub-cutaneous incision, by M. Signoroni," but it is very far from coming within the category of successful amputations or resections. The record is in many respects vague and unsatisfactory. No details are given of the disease requiring the operation. The operation itself, according to the author, was not an amputation properly so called, but an extraction of the bones, by means of forceps, and the use of the bone scissors. There were no incisions made, except of the buccal mucous membrane, where it is attached to the surfaces of the jaw. Moreover, the extraction was not effected by a single operation, but required a second, after the lapse of eight days. And still farther, the patient was not cured; for according to M. Signoroni, "at the end of nine months he succumbed to a reproduction of the disease."

Professor Syme [*Contributions to the Pathology and Practice of Surgery*, Edinburgh, 1848, p. 21], in the article on "Excision of the Lower Jaw," states that he disarticulated the jaw; but no details are given of the case or of the operation. Moreover, the patient referred to is stated by him to have died on the following day.

Mr. Perry's case, related in the *Medico-chirurgical Transactions*, [London, second series, vol. iii., 1838, p. 290], like that of M. Signoroni, was an extraction of the bone, piecemeal, at intervals, extending over a period of three weeks.

It would be easy to multiply negative facts of this kind; that is to say, to adduce cases where the operation of amputation of the entire lower

jaw was not performed; but those I have noticed and commented upon will suffice for my purpose. In reality, my claim to priority, which I now feel entitled to make, is based upon the positive fact that there exists no record, antecedent to my own, of an operative procedure of amputation of the entire lower jaw, performed with success upon the living body.

In regard to that operation, it was performed upon a principle analogous to that which would govern the amputation, in contiguity, of any other member similarly affected by disease. For example, the removal of the upper extremity at the scapulo-humeral articulation, would be preferred to an operation with section of the bone, where the disease was likely to return, if any portion of the shaft or head of the humerus were allowed to remain. As mentioned in the published report of my case, the body, only, of the bone was in a state of necrosis. To be more definite, the necrosis extended to the anterior edge of the masseter muscle of the left side, and some lines farther, upon the right side. But, although the necrosis did not extend beyond the body of the bone, the condition of the rami, on both sides, was such as to demand their removal. If they had not been removed, they would have remained liable to caries or necrosis, in the progression of the disease; the maxillary muscles having become rigidly and permanently retracted, from the irritation of the disease, would have drawn, by the action of the pterygoid muscles, the ramus of each side upon the bag of the pharynx, and so impeded deglutition; while the immovable position of the rami, occasioned by the permanent contraction of the temporal muscles, attached to the coronoid processes, would, upon the deposition of new bone, have led to increased irritation and danger. Lastly, the dilapidated condition of the patient, together with his inability to endure much longer the torture under which he was laboring, from the irritation propagated to the ramifications of the third branch of the fifth pair of nerves, lodged in the dental canals, furnished an additional reason for total disarticulation.

In conclusion, I may remark that the patient now, ten months after the operation, is pursuing his vocation as a dairyman, in a state of perfect health. The morbid specimen is deposited in the museum of the New York Medical College.







# CASE OF ELEPHANTIASIS ARABUM. TREATED BY LIGATION OF THE FEMORAL ARTERY

$LITM \cap R \subseteq AM \cap M \subseteq AM \cap C^*A$ .  $MfM \supseteq I \cap M$ .









ELEPHANTIASIS ARABUM  
OF THE  
RIGHT INFERIOR EXTREMITY:  
SUCCESSFULLY TREATED  
BY LIGATURE OF THE FEMORAL ARTERY.

---

[From the New York Journal of Medicine, Sept., 1852.]

ELEPHANTIASIS ARABUM, so called in contradistinction to Elephantiasis Græcorum, because its history was first described by Arabian authors, is a malady, the etiology and pathology of which, are not definitively understood at the present day. The treatment also remains uncertain; and when the disease has existed for any length of time, it is generally looked upon as irremediable by any other means than amputation of the tissues, or of the member involved. This malady is not confined in its attacks to any particular part of the body; the vulva, the scrotum, and the inferior extremities are, however, the principal seats of the disease. When affecting the lower extremity, its peculiar form, which is somewhat like the clumsy appearance of the elephant's leg, suggested the name of Elephantiasis.

Elephantiasis of the Arabs is said to be uncommon in Europe, and as respects this country, I am not aware of its occurrence endemically, in any part of it. Insulated cases, however, certainly do present themselves. Within the last three years, five marked cases have come under my observation; of

these, in two instances, the malady showed itself in the scrotum, and, in the other three, the seat of the disease was in the inferior extremity. Four of these cases became developed in persons residing in different parts of the United States: one in New York, one in Florida, one in Virginia, and one in the State of Pennsylvania; the other case occurred in a patient who was a native of Ireland, and who imported the disease with him. These patients were all adult males, and the circumstances preceding the development of the disease in each case, were generally dissimilar; thus, in the cases where the inferior extremity was affected, the disease in one became manifested after an attack of paludal fever; in another also, after a febrile attack; and in the third, after the individual had been working for some time at an occupation requiring him to stand for hours with his legs immersed in water. In one of the two cases where the scrotum and integuments of the penis were affected, the elephantiasis was preceded by a scrotal hernia, and by an attack of syphilis, while the other was associated with, and preceded by, a large hydrocele of the tunica vaginalis testis.

Climate cannot be said to have exerted any influence, as the cases occurred in different localities. The accounts, however, related of this malady, will not allow us to doubt that it is met within certain latitudes and localities more frequently than in others. In the West Indies, some parts of Asia, and among the Arabs, it is found to exist endemically; but, although this fact is established, and points to the influence of climate, what that influence is, and how it operates, remains unaccounted for, with any degree of certainty. The enlargement of the thyroid gland, which occurs in certain parts of Europe and North America, is ascribed to the drinking of snow water, and of water impregnated with calcareous or earthy particles; while in the equatorial or tropical regions, the prevalence of elephantiasis is attributed to the alternations of heat and cold. But these speculations, resting as they do upon no positive data, are extremely vague, and thus, both as regards the more frequent occurrence in certain localities and as regards the difficulty of accounting for the influence of climate, elephantiasis and bronchocele, both hypertrophic conditions of the tissues, appear to have some analogy to each other.

The production of the disease has also been attributed to the obliteration



tion of the veins of the members affected, and likewise to chronic inflammation, commencing at the dermoid structure, and extending, by contiguity of tissue, to the sub-cutaneous layers; but again, it must be remarked that no fixed invariableness of antecedence has been observed. One fact, which may have some bearing upon the etiology of the elephantiasis, and to which I shall again presently allude, has been generally overlooked. I refer to the morbid condition and dilatation of the principal arterial trunk of the member affected. The disease has also been supposed to arise from frequent attacks of erysipelas; and, as another cause, from sub-inflammation of the absorbent vessels and lymphatic glands.

Elephantiasis, as in two of the cases which came under my observation, is sometimes rapid in its accession or invasion, and, when occupying an extensive surface, the constitution participates in the local affection. The skin assumes no erysipelatous hue; but the subcutaneous tissues become engorged, tumified, and tense; while the course of the lymphatics, if the seat of the malady be on a limb, is marked by nodulated cords; and the glands of the groin or of the axilla may also become affected and enlarged; these various symptoms being ushered in by a deep-seated and violent pain in the region of the disease.

If the disease, after the acute stage, does not recede, the intumescence remains, although the other symptoms may subside for a time. Exacerbations recur at intervals, varying in duration, and the enlargement of the tissues increases, until the structures invaded remain, as it were, stationary in their abnormal condition, imparting to the hand, when examined, a harsh, dense, pachydermatous sensation, and presenting to the eye, in the most characteristic form of the disease, a rough, scaly, dusky-looking mass of deformity, well represented in the accompanying illustration.

If the disease progresses no farther than has just been described, the enlargement of a limb, or of the scrotum, remains an insufferable encumbrance; while, in the uninterrupted progress of the disease, foetid and incurable ulcerations may occur, abscesses may take place among the morbid tissues, and the internal organs may become damaged. The prognosis, consequently, must be unfavorable, when the disease has existed for some time, and assumed its characteristic, chronic and intractable form.

In the early stages of the disease, it is possible that it may be confounded, especially in females, in whom the subcutaneous strata are usually thicker than in males, with diffuse and deep-seated inflammation of the cellular tissue, or with œdema or anasarca. The history and progress of the disease, the sensation imparted, upon examination, by the tumour, and the peculiar local traits, generally suffice to enable the practitioner to discriminate, without much difficulty, between elephantiasis and the other diseases just named.

It would appear, from the different accounts given of this disease, that the whole of the tissues of a member may become ultimately implicated. Some are primarily affected, while others, such as the bones, are probably not involved in the morbid degeneration, until the disease has been of long standing. The tissues primarily affected would seem to be the vascular; and the pain, redness and hardness met with in the first stage of the disease, in the course of the lymphatic vessels, together with the appearances of the veins, upon autopsy, as mentioned by Bouillaud and others, evince with sufficient certainty a pathologic condition of the vessels. The arteries also participate in the disease, and very probably at an early stage of its invasion.

The skin generally shows early participation in the malady; most commonly the development of the initiatory stage is accompanied by some form of cutaneous affection, such as eczema, erysipelas, lichen, or ulceration. These affections occur, however, so frequently without any of the hard and bulky intumescence characteristic of elephantiasis being manifested as a sequent, that it is reasonable to suppose they are accompaniments merely of disease of the deeper-seated tissues, especially of the vascular tissues upon which, in reality, the elephantiasis depends. The different strata of the skin are hypertrophied to a considerable degree, the epidermis presenting a series of dusky, hard, super-imposed scales. This condition of the epidermis, however, is not always present, especially when the scrotum is the seat of the disease. The sub-cutaneous adipo-cellular layer is blended with the dermoid tissue, so as to form a hard, dense and lardaceous mass of irregular thickness; the sub-aponeurotic and inter-muscular cellular tissue becomes also changed and hypertrophied; the muscles, also, are in the progress of the dis-



ease perverted, becoming softened and less deeply colored than in their normal condition—sometimes being converted into fatty tissue, at others into an indurated formation, and even, at times, exhibiting deposits of bony material. The nerves are sometimes found to be increased in size; the bones are sometimes found unaltered, and sometimes are found increased in size; and, lastly, the interosseous ligament is at times found ossified. Lesions of the internal organs are not so frequently found to accompany elephantiasis Arabum as the other form, known as elephantiasis Græcorum; still, diseases of the internal viscera are seen as complications of the former, when the malady has existed for a long period.

In its initiatory stage, the treatment of elephantiasis, regarded as a *phlegmasia*, should be conducted upon antiphlogistic principles; thus bleeding, emollient applications, tepid baths, and the vapor *douche*, are recommended and resorted to. In the more chronic stages of the malady, compression, combined with scarifications and local bleeding, is said to be useful. Iodine frictions and the vapor *douche* appear to merit most attention, having, upon good authority, been used advantageously in cases of genuine elephantiasis.

When the disease has resisted every rational curative method, and when the part attacked has attained a size which, by reason of the weight of the mass, renders it an unmanageable encumbrance, as happens in elephantiasis of the scrotum and of the inferior extremities, amputation is advised and practised as the only alternative. But this extreme resort is not usually attended with success, the disease generally returning upon some other member with all its original inveteracy and obstinacy.

In the following case, which came under my management, I resorted to a method of treatment which, as far as I know, is entirely novel, and which, both for this reason and because it terminated in the perfect restoration of the diseased and cumbrous limb to its normal condition and functions, I have thought deserving of publicity.

The annexed drawing of the limb of the patient, taken from nature, gives an accurate representation of the disease.

CASE.—Charles Roller—of lymphatic temperament and short stature, æt. 27, born in Aix-la-Chapelle, occupation, merchant—left his home in Decem-



ber, 1849, landed in New York in February, 1851, went thence to Connecticut, where for eight months he worked in a factory, standing during his hours of labor; thence went to Virginia, where he worked on a farm for about six months, at the expiration of which period he was taken with fever, of an intermittent character. Up to that time, he had always been in good health.

During the fever, the inguinal glands on the right side became swollen and painful; the swelling and pain extending in the course of the femoral vessels as far as the knee. The pain was followed by swelling and redness of the thigh down to the knee. From the knee, the pain and swelling continued to extend downwards as far as the toes; being, at this time, confined chiefly to the portions of the limb along the course of the saphena vein, and also of the posterior tibial vessels. The redness and tumefaction here, as in the thigh, were preceded by deep-seated pain. The tumefaction of the limb continued to increase; while, at the same time, febrile exacerbations occurred at intervals, varying from two to six days. After a period of about six weeks from the commencement of the disease, the fever entirely disappeared; and by that time, also, the pain and redness had entirely ceased; the limb, however, remaining hard, swollen and rough, and presenting, in a marked degree, the peculiar characteristics of elephantiasis Arabum, in the chronic period of the disease. From that time forward, the hardness and intumescence gradually increased, and the limb became so cumbersome, that the patient was obliged to give up all business, and confine himself chiefly to a recumbent posture. In this condition, the patient left Virginia for the purpose of seeking medical relief at the New York Emigrants' Hospital, into which he was admitted the 15th of January, 1851. The appearance of the patient upon entering the hospital was somewhat emaciated. He had no febrile symptoms, and the chief difficulty, under which he labored, arose from the enlarged and hypertrophied condition of the right inferior extremity.

The limb was enlarged from the toes to within a short distance below Poupart's ligament. The thigh, although enlarged, was not much indurated; while, from a short distance above the patella, downwards, the limb presented a dense, hypertrophied, hard, scaly, shapeless mass, the appearance of which will be best apprehended by referring to the accompanying plate.

The morbid condition of the tissues pervaded the foot and toes, there presenting groups of tuberculated growths. The circumference of the limb around the ankle was nearly as large as that of the calf; measuring fifteen and one-half inches; while the circumference of the calf measured nineteen and one-half inches.

The patient was put under treatment upon entering the Hospital. The recumbent posture was enjoined, and for some time various discutient lotions were used. Bandaging was resorted to, with frictions of ung. Potass. Iodid; the Iodide of Potassium being also prescribed internally.

At times, also, the limb was painted with strong tincture of Iodine; local and general baths were used; regular bandaging of the limb, from the toes upward, being the while carefully observed.

This plan of treatment was perseveringly adhered to from the 15th of January to the 22d of March, a period of a little over two months, without any amelioration. Having thus tried, without success, the method of treatment most approved of, I proposed to place a ligature upon the femoral artery, with the view of changing the morbid condition of the structures supplied by the branches of this arterial trunk. A consultation was held, and my proposition was acceded to as preferable to amputation, the usual alternative resorted to in this stage and extent of the disease. Accordingly, on the 22d of March, 1851, I secured the femoral artery, a short distance below the origin of the *arteria profunda*. Upon exposing the femoral artery, this arterial tube was found to be changed, so as to present an appearance somewhat like the color of the aorta of the ox, and to be larger than the common iliac of the human subject. In consequence of this appearance of the artery, after some hesitation, I applied the ligature; preferring to do this, rather than to expose the external iliac, of the soundness of which I could not be certain.

The ligature came away from the femoral artery on the eleventh day, accompanied by secondary hemorrhage; the occurrence of which I had expected as probable. For the purpose of arresting the hemorrhage, the *external* iliac artery was secured by ligature, by Dr. A. E. Hosack, who happened to be on duty at the time in the Hospital. The external iliac was found to be about the size of the brachial artery. This, for a time, apparently had

some influence upon the hemorrhage; but, on the following day, bleeding was again renewed from the orifice, in the femoral artery, with as much profusion as ever.

The hemorrhage was now restrained by the prompt application of a tourniquet, on the *cardiac* side of the bleeding orifice, by the house surgeons Drs. Thompson and A. K. Smith.

This even failed to stop permanently the hemorrhage, and the blood recommenced oozing copiously at intervals. The patient was now sinking fast, and the ligature of the common iliac, or amputation at the hip-joint, appeared to be the only resources left. But the hemorrhage now being evidently reflux, it was suggested to apply the tourniquet, so as to produce compression on the *distal* side of the bleeding orifice: this was done, and was followed by a complete cessation of the bleeding.

From that time (April fourth, 1851), the house surgeon kept an instructive record of the case, which I have now before me. For several days, the pulse ranged from 115 to 108: the dressings were carefully attended to, and light diet prescribed. On the twelfth, the leg was found to be considerably reduced in size, and the ligature of the external iliac came away. On the seventeenth, brandy and quinine, with good nourishment, were ordered. On May the first, finding the leg still more reduced and the lower wound healed, I ordered tincture of iodine to be painted on the leg, and the bandage to be continued; I also ordered a solution of chloride of soda to be used as a wash on the upper wound, which continued to discharge freely.

The patient now went on gradually improving in strength and appearance, and left the Hospital in the latter part of June, completely cured of his malady. At this date, sixteen months after the ligature of the femoral artery, the patient is in robust health, and presents no indications that the disease will return.

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[From the *New York Medical Gazette*, Jan., 1858.]

IN September, 1852, I recorded a case of Elephantiasis Arabum successfully treated, by ligature of femoral the artery. Since then, I have received a letter from Prof. Erichsen, of the London University, in which he mentions a case of Elephantiasis treated, with a successful result, upon the same principle.

The portion of his letter referring to this subject runs as follows: "I have perused the details of your cases with great interest, and have been especially struck by the account of the successful ligature of the femoral artery for that otherwise intractable disease, Elephantiasis Arabum. The operation was certainly a bold step, but one that the result shows to have been the proper one to take; and it certainly does infinite credit to your judgment and skill, to have devised a successful treatment for this complaint. I have at present under my care a man with extensive Elephantiasis of the foot, in whom, about two months ago, the Assistant Surgeon, during my absence, tied the anterior tibial, in the middle third of the leg. This case has done well, and the limb is fast recovering its usual dimensions. The operation was performed on hearing of the success of your case."

The following case is another example of the beneficial results of this practice, in a disease hitherto deemed incurable by other means:

Francisco Podesta, a native of Italy, 39 years of age, peasant by occupation, was admitted into the State Emigrants' Hospital, on the 17th of April, 1857. About six years previous to his admission, after prolonged exposure to cold and dampness, he was attacked with severe pains in the left leg, extending upwards along the thigh. The pain was followed by general tumefaction of the leg from the toes upward to the knee joint. The local disease was attended by constitutional disturbance, which, however, gradually subsided; the limb remaining much disfigured and considerably larger than that of the opposite side. The foot was thickened, and appeared stunted, from the increased circumference around the ankle; the calf of the leg was also considerably enlarged; the skin and sub-cutaneous tissues were dense, hard, and hypertrophied; the surface of the limb below the knee was scaly, and, in general, presented the unseemly appearance from which the term Elephantiasis has been derived. Around the ankle the hypertrophied tissues were

thrown into large and prominent folds, hanging, as it were, over the ankle joint; between two of these folds an extensive ulceration existed, as large as a dollar piece. The patient, in this condition, was unable to follow any vocation; in fact, was unable to walk, and entered the hospital more as an asylum, than with the hope of obtaining relief. His general condition was feeble, and he presented a cachectic appearance. The following were the measurements of the limb: the thighs at the middle were of equal measurement, 19 inches; around the calves on the sound side, 10 inches; on the diseased side, 13 inches; above the ankles on the sound side,  $8\frac{1}{4}$  inches; on the diseased side, 12 inches; around the ankles on the sound side,  $9\frac{1}{4}$  inches; on the opposite side,  $15\frac{1}{2}$  inches; while the measurement from the heel around the instep on the sound side was 12 inches, and 19 inches on the diseased side.

Deeming it unnecessary to repeat in this patient's case the numerous remedies which had been unavailingly tried, I proposed to apply a ligature upon the femoral artery, for the purpose of modifying the morbid nutrition of the limb. Allowing him some time to improve his general health, and to become accustomed to the air of the hospital, on the 23rd of May a ligature was applied on the femoral artery in Scarpa's space. The artery was found to be healthy and of normal size. May 27th: Everything had progressed favorably up to this time, and the limb was beginning to show evidence of diminution. July 1st, the ligature came away; at this time, the calf of the diseased side had diminished 1 inch above the ankle; around the ankle,  $1\frac{3}{4}$  inches; and in the measurement in the heel around the instep,  $3\frac{1}{2}$  inches; the skin of the leg and foot was also soft. July 10th, the patient was allowed to move about, the ankle joint, which previously was almost immovable, now admitted of flexion and extension. The ulceration had now healed, and from that time forward until the 24th of August, (the time of his discharge from the hospital,) the dense and hardened tissues were gradually becoming more natural and soft. He left the hospital with his limb almost of natural size, and able to walk with but slight lameness.

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SINCE the publication of the last case, I have repeated the operation of tying the femoral artery, in three instances, for the cure of elephantiasis. These cases occurred in two young women, one of whom had the disease on one inferior extremity: the other had both of the lower limbs affected.

The following is a brief history of these cases:

Ann O'Brien, native of Ireland, domestic, aged 25 years, apparently in robust health, had had one child, was admitted into the hospital on the 27th November, 1857. She stated that she had suffered considerable pain in the right leg, during the last five years. About twelve months ago the leg began to enlarge, and continued to do so until the time of her admission. At that time the foot, especially on the dorsum, was considerably enlarged. Above the ankle the leg was much increased in size; the skin there presenting thick pachydermatous folds, hanging over the ankle joint, so as to prevent the motion at the articulation. The enlargement of the limb extended upwards above the knee, as far as the middle of the thigh, and she was totally unable to perform her duty as a domestic.

The following measurements of the diseased and sound limbs were taken previous to the operation, which was performed on the 12th December, 1857, by applying the ligature around the artery in the Scarpa's space.

The diseased side measured, around the middle of the thigh,  $20\frac{3}{4}$  inches; the sound side,  $19\frac{1}{4}$  inches; above the knee of diseased side, the measurement was  $15\frac{1}{2}$  inches; on sound side,  $14\frac{3}{4}$ ; immediately under the knee,  $13\frac{3}{4}$  inches, on diseased side; on the other side, 13 inches; at middle of calf, 14 inches, on diseased side; on sound side, 13 inches; below the calf, on diseased side,  $13\frac{3}{4}$  inches; on the other side,  $10\frac{1}{4}$  inches; around the ankle of diseased limb,  $11\frac{3}{4}$  inches; on the other side,  $8\frac{7}{8}$  inches; around instep, on the diseased foot, 11 inches; around the other,  $9\frac{1}{2}$  inches; around the top of diseased foot,  $9\frac{3}{4}$ ; around the other,  $8\frac{3}{4}$ .

The femoral artery, at the seat of the ligature, was healthy; every thing progressed favorably, and the ligature dropped off on the 28th day after the operation. Soon after the application of the ligature, the dense character of the tissues of the leg became much softer; the spine of the tibia could be traced by the finger, which could not be done previously; the folds around



dense tissues, and above the ankle, became soft and diminished: the flexion and extension of the joint could be accomplished.

The following measurements were taken on the 26th December, fourteen days after the operation; showing, by reference to the first measurements, that the limb had considerably diminished:—Right side, diseased, around the middle of the thigh,  $19\frac{1}{2}$  inches; around, above the knee,  $15\frac{1}{2}$  inches; under the knee,  $12\frac{3}{4}$  inches; around the middle of the calf,  $12\frac{1}{2}$  inches; around the ankle,  $10\frac{3}{4}$  inches; around the instep,  $10\frac{1}{4}$  inches; around the toes, 9 inches.

This patient now walks about with alacrity. After walking for a length of time without a bandage, the limb becomes somewhat enlarged; but the tissues are now soft and compressible, and the limb is gradually regaining its natural condition.

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THE last case which has come under my observation is of interest, as both of the lower limbs were affected, and both femoral arteries were tied.

Catherine Punch, native of Ireland, aged 26 years, unmarried, entered the Hospital on the 29th of October, 1857, for Elephantiasis of both legs.

For several years past she had suffered from pain in the legs, especially in the right one. About three years since, her legs began to enlarge, and they have slowly increased up to the present time.

The right limb being most diseased, the femoral artery was tied on the 30th January, 1858: the artery was healthy, and the ligature came away on the twenty-third day after the operation. After the application of the ligature, the tissues of the limb soon became softer and more natural, and the size also gradually diminished.

The patient was so much satisfied with the result of the first operation, that she insisted upon having the artery tied upon the left side. On the 17th April, two months and a half after the first ligature had been applied, the left femoral artery was tied. Only eleven days have elapsed since the operation, yet there is a decided amelioration in the condition of the limb, both as regards the diminished size and the induration of the tissues.



# CONTRIBUTIONS

TO

## OPERATIVE SURGERY AND SURGICAL PATHOLOGY,

BY  
**J. M. CARNOCHAN,**

PROFESSOR OF SURGERY IN THE NEW YORK MEDICAL COLLEGE, SURGEON-IN-CHIEF TO THE STATE HOSPITAL, &C., &C.

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